We Claim:

1. A chemical imaging fiberscope for imaging and collecting Raman spectra from a sample comprising:
   one or more laser illumination fibers for transmitting laser light of a specific laser excitation wavelength from a first source to said sample;
   a plurality of collection fibers, for receiving light scattered from said sample;
   a spectral filter positioned between said one or more laser illumination fibers and said sample for transmitting said laser light of a specific laser excitation wavelength and rejecting light of other wavelengths; and
   a spectral filter positioned between said sample and said plurality of collection fibers for transmitting wavelengths of light other than said specific laser excitation wavelength.

2. The chemical imaging fiberscope of claim 1 wherein said plurality of collection fibers are arranged in a coherent bundle.

3. The chemical imaging fiberscope of claim 1 wherein said spectral filters exhibit environmental insensitivity to temperature and humidity.

4. The chemical imaging fiberscope of claim 1 further comprising one or more lenses positioned between said sample and said plurality of collection fibers.

5. The chemical imaging fiberscope of claim 1 further comprising a housing for enclosing the fiberscope.

6. The chemical imaging fiberscope of claim 5 further comprising a window disposed at the distal end of said fiberscope.

7. The chemical imaging fiberscope of claim 6 wherein said window is composed of a material selected from a group comprising quartz, diamond and sapphire.

8. The fiberscope assembly of claim 1 wherein said laser spectral filter is spatially patterned into a first portion for filtering said laser light and a second, transparent portion for transmitting light scattered or reflected by said sample to said plurality of collection fibers.

9. The fiberscope assembly of claim 1 wherein said spectral filters are composed of a filter type selected from a group comprising dielectric, holographic and rugate spectral filters.

10. The chemical imaging fiberscope of claim 1 further comprising a plurality of white light illumination fibers for transmitting white light from a second source to said sample.

11. The chemical imaging fiberscope of claim 10 wherein said plurality of collection fibers are arranged in a coherent bundle.

12. The chemical imaging fiberscope of claim 10 wherein said spectral filters exhibit environmental insensitivity to temperature and humidity.

13. The chemical imaging fiberscope of claim 12 further comprising one or more lenses positioned between said sample and said collection.

14. The chemical imaging fiberscope of claim 10 further comprising a housing for enclosing the fiberscope.

15. The chemical imaging fiberscope of claim 14 further comprising a window disposed at the distal end of said fiberscope.

16. The chemical imaging fiberscope of claim 15 wherein said window is composed of a material selected from a group comprising quartz, diamond and sapphire.

17. The fiberscope assembly of claim 10 wherein said laser spectral filter is spatially patterned into a first portion for filtering said laser light and a second, transparent portion for transmitting light scattered or reflected by said sample to said plurality of collection fibers.

18. A chemical imaging fiberscope for imaging and collecting Raman spectra from a sample comprising:

one or more laser illumination fibers for transmitting laser light of a specific laser excitation wavelength from a first source to said sample;
a plurality of collection fibers for receiving light scattered from said sample;
a spectral filter positioned between said one or more laser illumination fibers and said sample for transmitting said laser light of a specific laser excitation wavelength and rejecting light other wavelengths;
a spectral filter positioned between said sample and said plurality of collection fibers for transmitting wavelengths of light other than said specific laser excitation wavelength;
a spatial filter positioned between said sample and said collection fibers for controlling the angular field of view of said collection fibers;
one or more lenses positioned between said sample and said plurality of collection fibers;
a housing for enclosing the fiberscope; and
a window disposed at the distal end of said fiberscope.

19. The chemical imaging fiberscope of claim 1 further comprising a spatial filter positioned between said sample and said collection fibers for controlling the angular field of view of said collection fibers.

20. The chemical imaging fiberscope of claim 17 wherein said spectral filters exhibit environmental insensitivity to temperature and humidity.

21. A chemical imaging fiberscope for imaging and collecting Raman spectra from a sample comprising:

a plurality of collection fibers, in a coherent bundle arrangement, for receiving light scattered or reflected from said sample;
a spectral filter positioned between said sample and said coherent fiber bundle for transmitting wavelengths of light other than said laser light of a specific laser excitation wavelength;
one or more lenses positioned between said sample and said plurality of collection fibers;

a spatial filter positioned between said sample and said plurality of collection fibers for controlling the angular field of view of said collection fibers;
one or more white light illumination fibers for transmitting white light from a second light source to said sample;
a housing for enclosing the fiberscope; and
a window disposed at the distal end of said fiberscope.

22. A chemical imaging fiberscope for imaging and collecting Raman spectra from a sample comprising:
one or more laser illumination fibers for transmitting laser light of a specific laser excitation wavelength from a first source to said sample;
a plurality of collection fibers for receiving light scattered from said sample;
a spectral filter positioned between said one or more laser illumination fibers and said sample for transmitting said laser light of a specific laser excitation wavelength and rejecting light of other wavelengths;
one or more lenses positioned between said sample and said plurality of collection fibers;
a spatial filter positioned between said sample and said plurality of collection fibers for controlling the angular field of view of said collection fibers;
one or more white light illumination fibers for transmitting white light from a second light source to said sample;
a housing for enclosing the fiberscope; and
a window disposed at the distal end of said fiberscope.

23. A chemical imaging fiberscope of claim 1 further comprising:
a mount for holding the fiberscope distal end in proximity to said sample;
a link for directing the output of the fiberscope under white light illumination conditions to a live video camera;
a link for directing the output under laser illumination conditions to a Raman spectrometer;
a link for directing the output under laser illumination conditions to a Raman chemical imaging spectrometer and detector.

24. The system of claim 21 wherein said imaging spectrometer is of the liquid crystal tunable filter type.

25. The system of claim 21 further comprising software and hardware for producing and displaying a Raman image of said sample.

26. A method of using a chemical imaging fiberscope comprising the steps of:
producing a Raman spectrum of a sample of tissue or cellular material;
producing a Raman image of a sample of tissue or cellular material;
comparing said Raman image with a library of Raman spectra stored for healthy tissue or cellular material and abnormal tissue or cellular material;
selecting a closest match between said Raman image and said library of Raman spectra; and
producing an image of said tissue or cellular material sample from said selected matches.

27. The chemical imaging fiberscope of claim 10 further comprising a spatial filter positioned between said sample and said collection fibers for controlling the angular field of view of said collection fibers.